STUDY OF THE TECHNOLOGY FOR OBTAINING AND SEDATIVE EFFECT OF A COMBINED RAW MATERIAL CONSISTING OF THE AERIAL PARTS OF HYPERICUM SCABRUM, MELISSA OFFICINALIS AND LEONURUS TURKESTANICUS

[1]EGAMOVA F.R., [2]YUSUPOVA S.M., [3]ABDURAKHMANOV B.A., [4]NEGMATOVA M.U., [5]TILOVOVA G.KH., [6]KHALILOV R.M.

Institute of Plant Chemistry of the Academy of Sciences of Uzbekistan, Tashkent, 100170, Uzbekistan
E-mail: ferustamovna_14@mail.ru

Currently, there is a trend of increasing levels of psychopathological disorders, especially various psychogenic neurotic conditions. This situation is potentiated by various socio-psychological and biological factors leading to stress, manifested by increased fatigue, decreased performance, irritability, tension, anxiety, low mood, loss of habitual interests, and sleep disturbances. The most optimal treatment for neurotic conditions involves sedative agents, particularly those of plant origin. Given the above, targeted research is being conducted worldwide to develop sedative combination drugs for the treatment of nervous system disorders, especially those based on standardized plant extracts. The most popular traditional multicomponent herbal medicines globally are extract-based drugs from combined plant materials, which are among the most convenient and standardized galenic preparations. The purpose of this work is to develop a technology for obtaining dry extracts based on aqueous extraction from Hypericum scabrum, Melissa officinalis, and Leonurus turkestanicus, and to study their sedative activity. The developed technology for obtaining dry extracts from the studied plants is as follows. Hypericum scabrum is loaded into an extractor equipped with a steam jacket and a pump for circulating the extractant. Water is added (hydromodule 1:6), steam is supplied to the jacket, and extraction is carried out by circulating the extractant at 60°C. The first extraction lasts 5 hours, then the extract is drained. A new portion of purified water is added, and the second extraction is conducted under the same conditions. The second extract is drained, and a third extraction is carried out similarly (total hydromodule 1:18). The obtained extracts are cooled, combined, and filtered through a vacuum nutch filter (-0.8…-0.4 kgf/cm²) lined with belting. The filtered extract is concentrated (vacuum -0.8…-0.6 kgf/cm², temperature 60°C) to a dry matter content of 60%. The resulting concentrate is transferred to a container, and 96% ethanol is added in a volume ratio of concentrate to alcohol of 1:4 with vigorous stirring. The container is then sealed and left for 6 hours. The resulting precipitate is removed by filtration. The filtrate is diluted with purified water to a dry residue content of 15% and fed into a spray dryer at 5 L/h, with inlet temperature 160–180°C, outlet temperature 80–90°C, and air pressure 0.15 MPa. The yield was 6.2% of the raw material weight.Dry extracts of Melissa officinalis and Leonurus turkestanicus were obtained by the same method. Yields were 6.0% and 5.3%, respectively. Based on the extracts of Hypericum scabrum, Melissa officinalis, and Leonurus turkestanicus, compositions were created in the ratios 1:1:1, 1:2:1, 2:1:1, and 2:1:2 (at doses of 50, 100, and 200 mg/kg). According to screening studies, the 2:1:1 composition at a dose of 100 mg/kg (provisionally named “Hypermelene”) showed the most pronounced sedative effect.In this study, the effect of Hypermelene, as well as individual dry extracts of each plant, on sleep duration in mice was investigated. For comparison, the drug Persen (Sandoz, Slovenia) was used. Experiments were conducted on 6 groups of 6 male mice each, weighing 18–20 g. Sleep was induced by intraperitoneal administration of sodium ethaminal at a dose of 40 mg/kg. Hypermelene at 100 mg/kg, as well as dry extracts of Hypericum scabrum (50 mg/kg), Melissa officinalis (25 mg/kg), Leonurus cardiaca (25 mg/kg), and the reference drug Persen (50 mg/kg) were administered orally 1 hour before sodium ethaminal. The average sleep duration in the control group was 53.4±1.9 minutes. With Hypermelene and individual extracts, sleep duration increased by 80.1%, 38.2%, 26.0%, and 18.9%, respectively, compared to the control group. The reference drug Persen increased sleep duration by 70%.
Thus, among the studied extracts, Hypermelene at a dose of 100 mg/kg demonstrated the highest sedative activity in this experiment, and in this activity it was not inferior to the comparison drug Persen.